Pine Lake
Aquatic Vegetation Management Plan Update

February 20, 2006

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INTRODUCTION

This report was created in order to update the Pine Lake Aquatic Vegetation Management Plan. The plan update was funded by the Indiana Department of Natural Resources Lake and River Enhancement Program (LARE) and the Laporte Area Lake Association. The update serves as a tool to changes in the vegetation community, to adjust the action plan as needed, and to maintain eligibility for additional LARE funds. Items covered include the 2005 sampling results, a review of the 2005 vegetation controls, and updates to the budget and action plans. There was no update to the fisheries section required due to the lack of additional data. Once this plan is reviewed and approved, the update should be included in the original vegetation management plan, following the reference section and prior to the appendix.

2005 PLANT SAMPLING RESULTS

Two surveys were completed in 2005 in order to document changes in the plant community and to determine success or failure of control techniques. A tier I and tier II survey were completed in June. These surveys allowed for determination of control areas and documentation of changes in emergent and rooted floating plants. A second tier II survey was completed in early September. This survey was completed in order to document success or failure of control techniques and to compare to the 2004 tier II survey that was also completed in the late summer. This survey will also allow for the documentation of any changes in the native plant community.

Tier I Survey

On June 14, 2005 a tier I survey was completed on Pine Lake. The tier I survey revealed ten distinct plant beds within Pine Lake totaling 489.0 acres. (Table 1 & Figure 1). Vegetation was present to a maximum depth of 24 feet and twenty different species were observed. Plant beds varied widely in size and species diversity.

Table 1. Pine Lake, Tier I Survey Results, June 14, 2005

Plant Bed I.D.	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
Plant Bed Size (acres)	241.3	74.1	3.1	1.0	2.2	74.0	60.8	2.0	14.5	15.6
	Rating*	Rating*	Rating*	Rating*	Rating*	Rating*	Rating*	Rating*	Rating*	Rating*
Eel grass	1	2	2	2	-	-	1	-	2	-
Elodea	1	2	-	1	1	-	1	1	1	2
Curlyleaf pondweed	1	1	-	-	-	-	-	-	-	-
Robbin's pondweed	3	2	3	1	3	-	3	2	3	-
Richardson's pondweed	3	3	-	-	1	2	3	-	2	-
Largeleaf pondweed	3	4	1	-	-	3	3	-	1	-
Sago pondweed	1	-	-	-	-	-	1	-	1	-
Northern watermilfoil	1	1	-	-	1	-	1	-	1	1
Eurasian watermilfoil	1	1	2	2	3	-	1	2	1	-
Flatstem pondweed	3	2	-	-	-	1	2	-	2	-
Spatterdock	1	1	-	-	-	1	-	-	1	2
White water lily	1	-	-	-	-	1	-	-	1	1
Bur-marigold	1	1	-	-	-	1	1	1	1	-
Coontail	-	1	-	-	3	-	-	2	-	1
Whorled watermilfoil	-	1	-	-	1	-	-	-	-	2
Chara sp.	-	1	-	1	-	-	1	-	-	1
Water stargrass	-	1	1	-	1	-	1	-	-	-
Slender naiad	-	-	1	-	-	-	1	1	1	1
Nitella sp.	-	-	-	-	-	-	-	-	-	1
Bladderwort	-	-	-	-	-	-	-	-	-	1

*Rating based on score of 1-4 with 1 being least dense to 4 being most dense

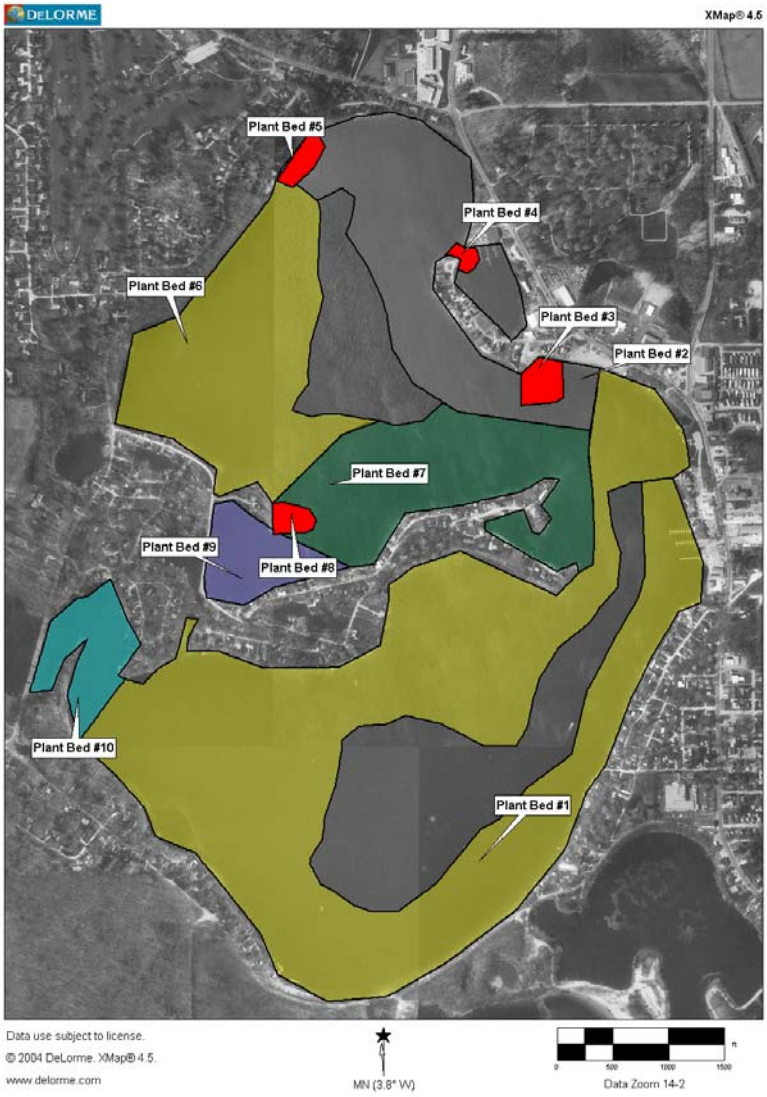


Figure 1. Tier I plant beds, Pine Lake, June 14, 2005.

Plant bed 1 was the largest plant bed surveyed at Pine Lake. The plant bed comprised the majority of the south basin (Figure 1). The total area was determined to be 241.3 acre and the substrate was primarily sand. A total of 13 species were observed within the plant bed. Plant bed 1 was dominated by submersed vegetation, but there were two species of rooted floating vegetation observed at the lowest abundance rating. Robbin's pondweed *(Potamogeton robbinsii)*, Richardson's pondweed *(Potamogeton richardsonii)*, largeleaf pondweed *(Potamogeton foliosus)*, and flatstem pondweed *(Potamogeton zosteriformis)* were the most abundant species. Eel grass *(Vallisneria Americana)*, elodea *(Elodea Canadensis)*, curlyleaf pondweed *(Potamogeton crispus)*, sago pondweed *(Potamogeton pectinatus)*, northern watermilfoil *(Myriophyllum sibiricum)*, Eurasian watermilfoil *(Myriophyllum spicatum)*, spatterdock *(Nuphar advena)*, white water lily *(Nymphaea tuberose)*, and bur-marigold *(Bidens beckii)* were all present in the plant bed at the lowest abundance rating (less than 2%).

Plant bed 2 was located north of plant bed 1 at the most northeastern area of the lake. The plant bed was determined to be 74.1 acres. The substrate of plant bed 2 was sand. A total of 15 species were observed with largeleaf pondweed the most abundant species in this plant bed. Richardson's pondweed was the next most abundant species in the plant bed. Robbin's' pondweed, eel grass, flatstem pondweed, elodea, whorled watermilfoil *(Myriophyllum verticillatum)*, chara *(Chara* sp.*)*, bur-marigold, curlyleaf pondweed, water stargrass *(Zosterella dubia)*, northern watermilfoil, Eurasian watermilfoil, coontail *(Ceratophyllum demersum)*, and spatterdock comprised the rest of the plant bed at lower abundance ratings.

Plant bed 3 was located inside of plant bed 2 in the southeastern area of the zone. The plant bed was determined to be 3.1 acres. The substrate of plant bed 3 was sand. Robbin's pondweed was the most abundant species in the plant bed. Eel grass and Eurasian watermilfoil were the next most abundant species in the plant bed. Largeleaf pondweed, slender naiad *(Najas flexilis)*, and water stargrass comprised the rest of the plant bed at lower abundance rates. This plant bed was of concern due to a relatively high abundance of Eurasian watermilfoil.

Plant bed 4 was also located inside of plant bed 2 northeast of plant bed 3. The plant bed was determined to be 1.0 acre. The substrate of plant bed 4 was sand. Eel grass and Eurasian watermilfoil were the most abundant species in the plant bed. Robbin's pondweed, elodea, and chara were also observed in the plant bed at the lowest abundance rating. Much like plant bed 3, the high density of Eurasian watermilfoil made this bed one of concern.

Plant bed 5 was also located inside of plant bed 2 along the northwestern shoreline of Pine Lake. The plant bed was determined to be 2.2 acres. The substrate of the plant bed was sand. Eurasian watermilfoil, coontail, and Robbin's pondweed were the most abundant species in the plant bed. Northern watermilfoil, elodea, Richardson's pondweed, water stargrass, and whorled watermilfoil were observed in the plant bed at the lowest abundance rating. Plant bed 5 was the largest area comprised of dense Eurasian watermilfoil.

Plant bed 6 was located southwest of plant bed 5 along the northwestern shoreline of Pine Lake and was determined to be 74.0 acres. The substrate of plant bed 6 was primarily sand. Largeleaf pondweed was the most abundant species in the plant bed. Richardson's pondweed, spatterdock, white water lily, flatstem pondweed, and bur-marigold comprised the rest of the plant bed at lower abundance ratings.

Plant bed 7 was located southeast of plant bed 6 and was determined to be 60.8 acres. The substrate of plant bed 7 was sand. Largeleaf pondweed, Richardson's pondweed, and Robbin's pondweed were the most abundant species in the plant bed. Eurasian watermilfoil, chara, elodea, slender niad, northern watermilfoil, bur-marigold, sago pondweed, eel grass, water stargrass, and flatstem pondweed were all observed in the plant bed at lower abundance ratings.

Plant bed 8 was located inside of plant bed 7 along the western shoreline of Pine Lake. The plant bed was determined to be 2.0 acres. The substrate of plant bed 8 was sand. Robbin's pondweed, coontail, and Eurasian watermilfoil were the most abundant species in plant bed 8. Slender naiad, elodea, and bur-marigold were also observed in the plant bed at the lowest abundance rating.

Plant bed 9 was located southwest of plant bed 8. The plant bed was determined to be 14.5 acres. The substrate of the plant bed was sand. Robbin's pondweed was the most dominate species in plant bed 9. Richardson's pondweed, flatstem pondweed, and eel grass were the next most abundant species in the plant bed. Eurasian watermilfoil, elodea, largeleaf pondweed, sago pondweed, white water lily, spatterdock, slender naiad, northern watermilfoil, and bur-marigold comprised the rest of the plant bed at the lowest abundance rating.

Plant bed 10 was located south of plant bed 9 and was determined to be 15.6 acres. The substrate of the plant bed was silt with sand. Whorled watermilfoil, spatterdock, and elodea comprised the majority of vegetation in this plant bed. Chara, nitella, white water lily, bladderwort, northern watermilfoil, coontail, and slender naiad comprised the rest of the plant bed at the lowest abundance rating.

Tier II Survey Results

Two tier II surveys were completed on Pine Lake in order to document the changes in the plant community and determine success or failure of control techniques. Surveys were completed on June 14 and September 9, 2005.

June Tier II survey

On June 14, 2005 a tier II survey was completed on Pine Lake immediately following the tier I sampling. A Secchi disk reading was taken prior to sampling and was found to be 12.0 feet. Plants were present to a maximum depth of 23 feet. Ninety-three sites were randomly selected within the littoral zone. Results of the sampling are listed in Table 2. Overall aquatic vegetation distribution and density is illustrated in Figure 2. The bottom half of Table 2 illustrates the frequency of occurrence, relative density, mean density, and dominance index of individual species collected from Pine Lake in June 2005.

Table 2. Occurrence and abundance of submersed aquatic plants in Pine Lake June 14, 2005.

Date:	6/14/2005		Littoral sites with plants:	93		Species diversity:	0.92
Littoral depth (ft):	23		Number of species:	20		Native diversity:	0.91
Littoral sites:	93		Maximum species/site:	8		Rake diversity:	0.88
Total sites:	93		Mean number species/site:	3.52		Native rake diversity:	0.87
Secchi:	12		Mean native species/site:	3.33		Mean rake score:	4.08

Common Name	Site frequency	Relative density	Mean density	Dominance
Flatstem pondweed	50.50	1.18	2.34	23.70
Largeleaf pondweed	47.30	1.38	2.91	27.50
Eel grass	39.80	0.42	1.05	8.40
Richardson's pondweed	35.50	0.80	2.24	15.90
Robbin's pondweed	34.40	0.65	1.88	12.90
Elodea	28.00	0.30	1.08	6.00
Bur-marigold	23.70	0.26	1.09	5.20
Slender naiad	23.70	0.25	1.05	4.90
Water stargrass	16.10	0.24	1.47	4.70
Northern watermilfoil	15.10	0.15	1.00	3.00
Coontail	9.70	0.18	1.89	3.70
Curlyleaf pondweed	9.70	0.16	1.67	3.20
Chara	9.70	0.11	1.11	2.20
Eurasian watermilfoil	8.60	0.12	1.38	2.40
Broadleaf watermilfoil	8.60	0.12	1.38	2.40
Sago pondweed	5.40	0.08	1.40	1.50
Whorled watermilfoil	4.30	0.04	1.00	0.90
Star duckweed	2.20	0.02	1.00	0.40
Variable pondweed	2.20	0.03	1.50	0.60
Common Bladderwort	1.10	0.01	1.00	0.20

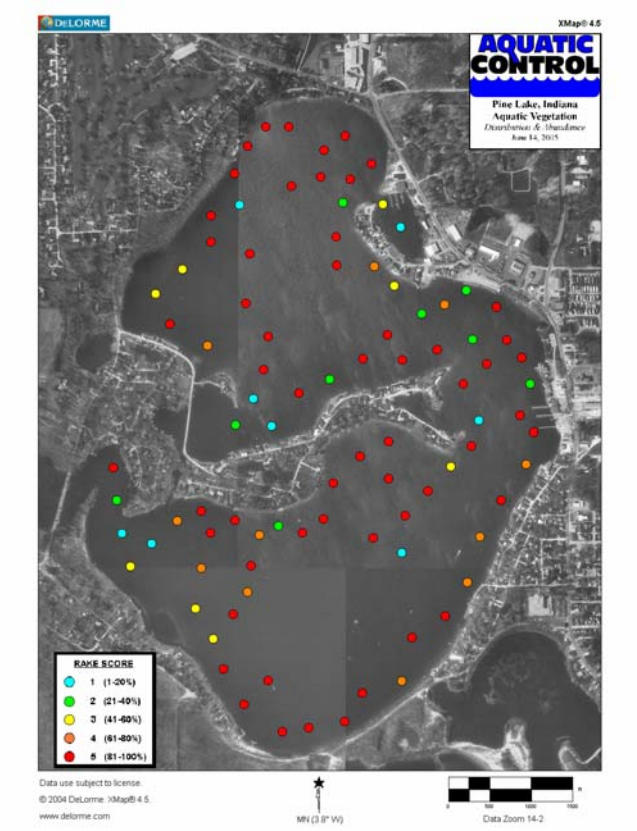


Figure 2. Pine Lake, aquatic vegetation distribution and abundance, June 14, 2005.

A total of 20 species were collected of which two of the species, curlyleaf pondweed and Eurasian watermilfoil, were exotics. Flatstem pondweed was present at the highest percentage of sample sites (50%) but ranked second in relative density. Largeleaf pondweed was ranked second in site frequency (47%) but ranked first in relative density. Location and density of largeleaf pondweed is illustrated in Figure 3. Eel grass ranked third in overall site frequency (39%) but ranked much lower in relative density. Richardson's pondweed ranked fourth in overall site frequency (35%) and third in relative density. Robbin's pondweed ranked fifth in frequency of occurrence (34%) but ranked fourth in relative density. Location and density of Robbin's pondweed is illustrated in Figure 4. Elodea ranked sixth in site frequency (28%) and relative density. Bur-marigold, slender naiad, water stargrass, northern watermilfoil, coontail, curlyleaf pondweed, chara, Eurasian watermilfoil, broadleaf watermilfoil, sago pondweed, whorled watermilfoil, star duckweed, variable pondweed, and common bladderwort were also present but at lower abundance and density. Location and density of bur-marigold is illustrated in Figure 5, curlyleaf pondweed in Figure 6, and Eurasian watermilfoil in Figure 7.

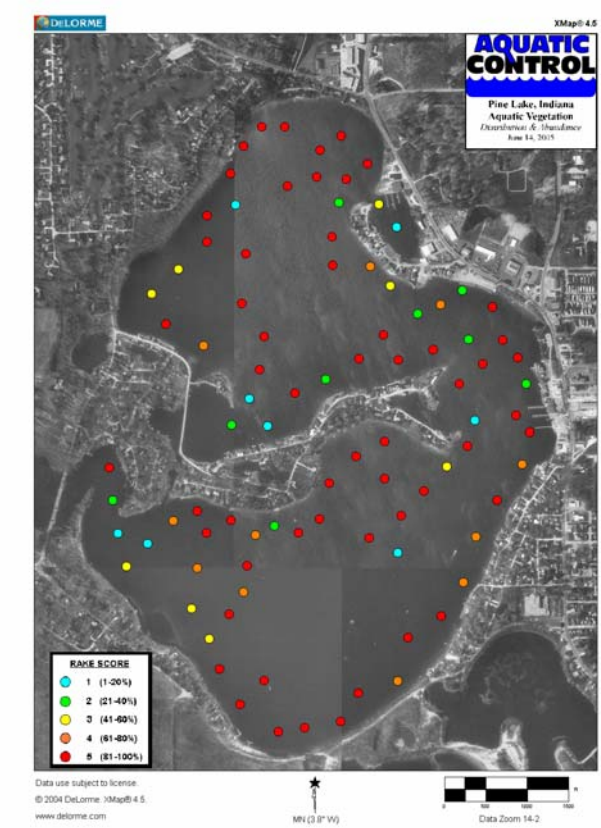


Figure 2. Pine Lake, aquatic vegetation distribution and abundance, June 14, 2005.

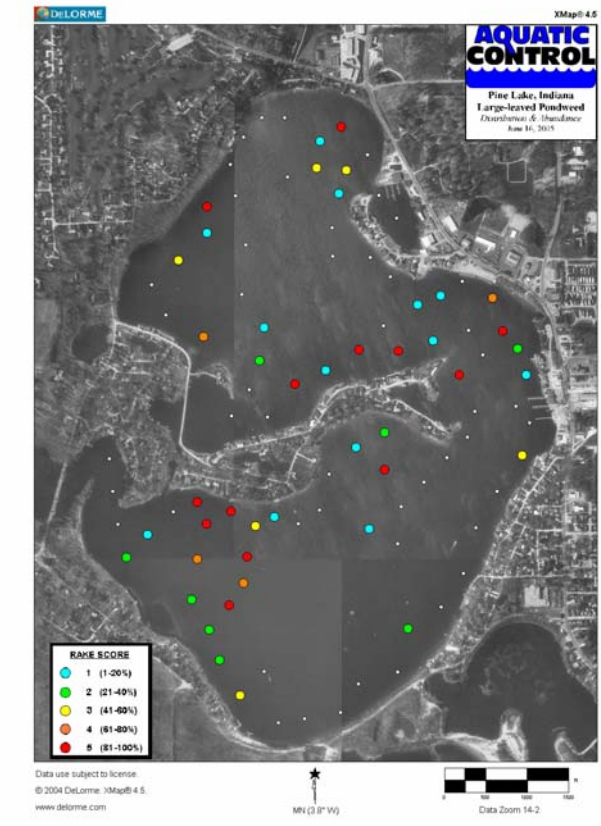


Figure 3. Pine Lake, largeleaf pondweed distribution and abundance, June 14, 2005.

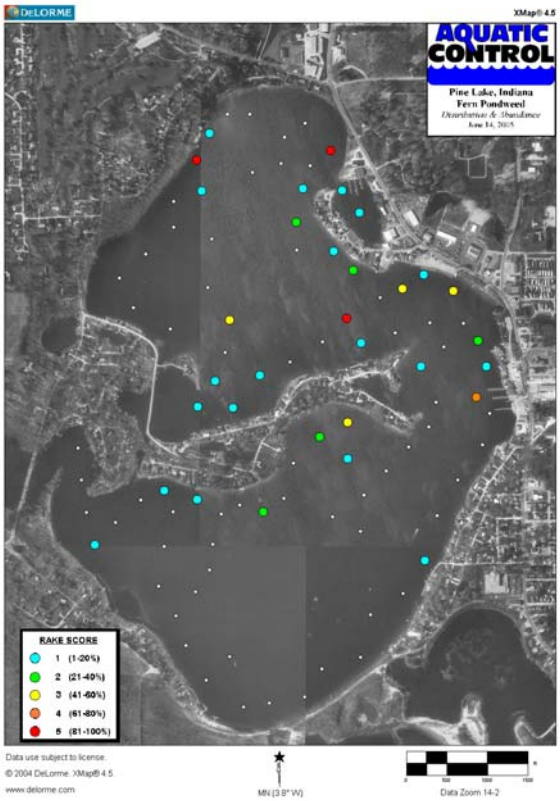


Figure 4. Pine Lake, Robbin's pondweed distribution and abundance, June 14, 2005.

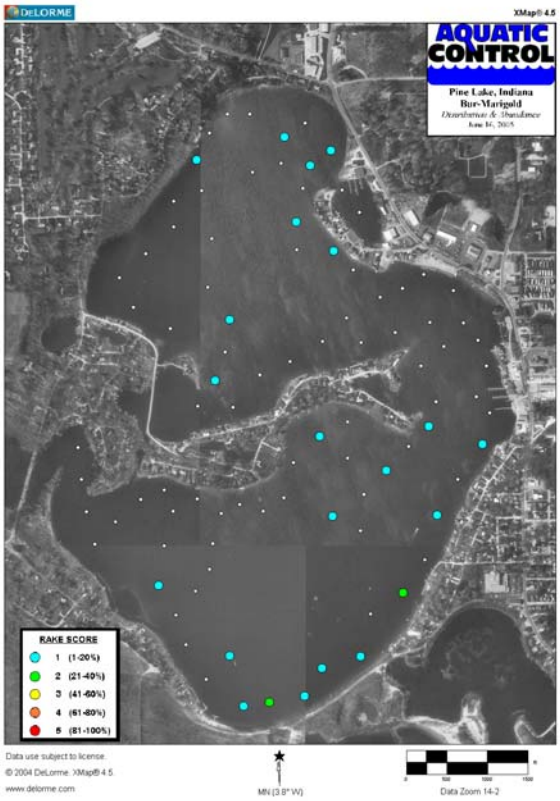


Figure 5. Pine Lake, bur-marigold distribution and abundance, June 14, 2005.

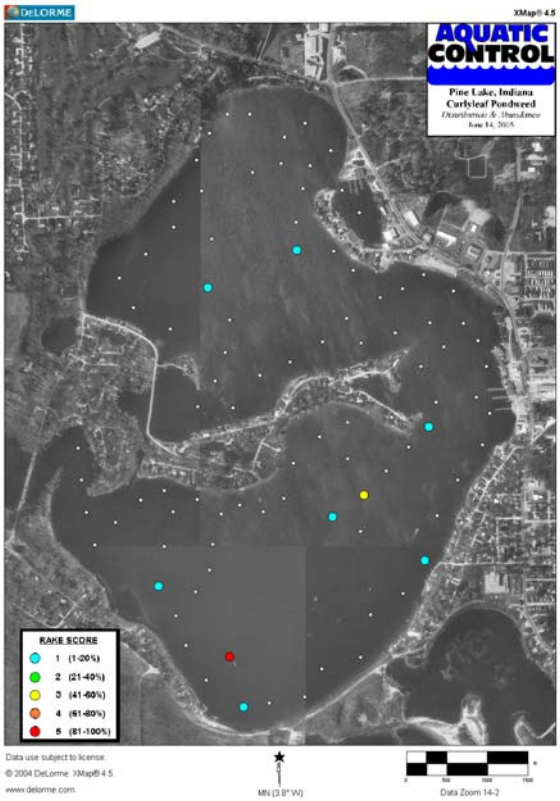


Figure 6. Pine Lake, curlyleaf pondweed distribution and abundance, June 14, 2005.

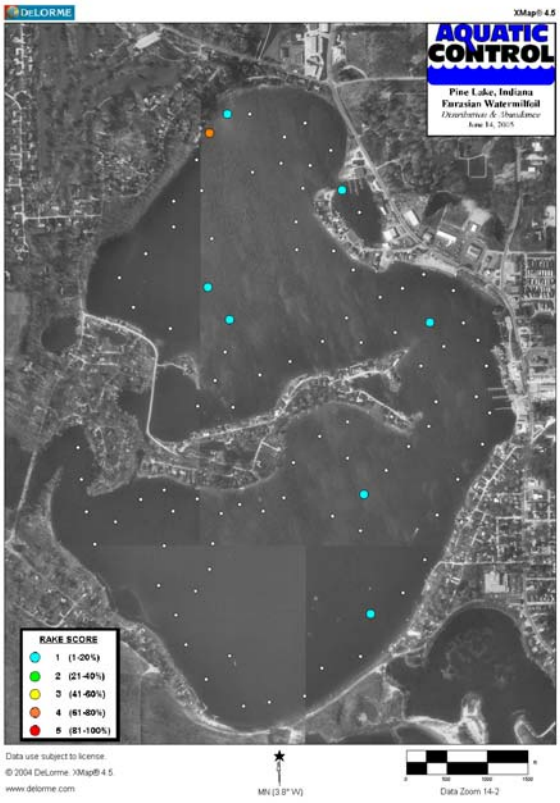


Figure 7. Pine Lake, Eurasian watermilfoil distribution and abundance, June 14, 2005.

September Tier II survey

The second round of tier II sampling took place on September 9, 2005. A Secchi disk reading was taken prior to sampling and was found to be 7.0 feet. Plants were present to a maximum of 13 feet. The same ninety-three sites were sampled in September as were in June. Results of the sampling are listed in Table 3. Overall aquatic vegetation distribution and density is illustrated in Figure 8.

Table 3. Occurrence and abundance of submersed aquatic plants in Pine Lake September 9, 2005.

Date:	9/9/2005		Littoral sites with plants:	88		Species diversity:	0.88
Littoral depth (ft):	13		Number of species:	18		Native diversity:	0.87
Littoral sites:	91		Maximum species/site:	6		Rake diversity:	0.84
Total sites:	93		Mean number species/site:	2.53		Native rake diversity:	0.83
Secchi:	7		Mean native species/site:	2.48		Mean rake score:	3.09

Common Name	Site frequency	Relative density	Mean density	Dominance
Eel grass	75.8	1.58	2.09	31.6
Richardson's pondweed	44.0	0.79	1.80	15.8
Elodea	39.6	0.55	1.39	11.0
Robbin's pondweed	30.8	0.48	1.57	9.7
Bur-marigold	22.0	0.23	1.05	4.6
Slender naiad	19.8	0.37	1.89	7.5
Coontail	12.1	0.13	1.09	2.6
Broadleaf watermilfoil	11.0	0.11	1.00	2.2
Water stargrass	9.9	0.11	1.11	2.2
Variable pondweed	9.9	0.11	1.11	2.2
Southern naiad	8.8	0.13	1.50	2.6
Northern watermilfoil	7.7	0.09	1.14	1.7
Eurasian watermilfoil	4.4	0.04	1.00	0.9
Leafy pondweed	4.4	0.05	1.25	1.1
Sago pondweed	3.3	0.05	1.67	1.1
Flatstem pondweed	3.3	0.03	1.00	0.6
Largeleaf pondweed	2.2	0.02	1.00	0.4
Chara	2.2	0.03	1.50	0.6

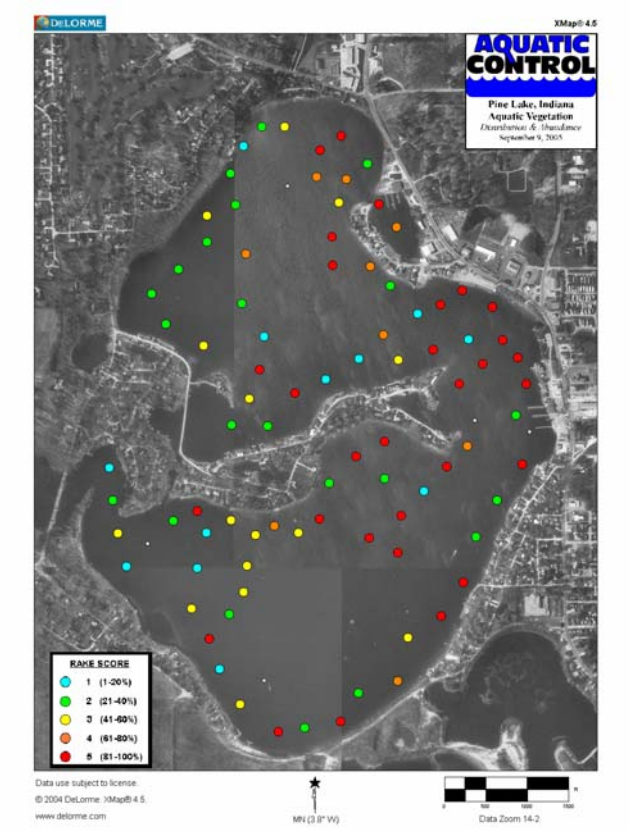


Figure 8. Pine Lake, Overall aquatic vegetation distribution and density, September 9, 2005.

A total of 18 species were collected of which 17 of the species were native (Eurasian watermilfoil was the only exotic species collected). Eel grass was present at the highest percentage of sample sites (74%) and also the highest relative density. Richardson's pondweed ranked second in site frequency (43%) and relative density. Elodea ranked third in site frequency (38%) and relative density followed by Robbin's pondweed (30%). Location and density of Robbin's pondweed is illustrated in Figure 9. Bur-marigold ranked fifth in site frequency (21%) and sixth in relative density (Figure 10). Slender naiad, coontail, broadleaf watermilfoil, water stargrass, variable pondweed, southern naiad, northern watermilfoil, Eurasian watermilfoil, leafy pondweed, sago pondweed, flatstem pondweed, largeleaf pondweed, and chara were also present but at a lower frequency. Eurasian watermilfoil decreased in site frequency, and relative density compared to the June 2005 tier II survey. Location and density of Eurasian watermilfoil is illustrated in Figure 11.

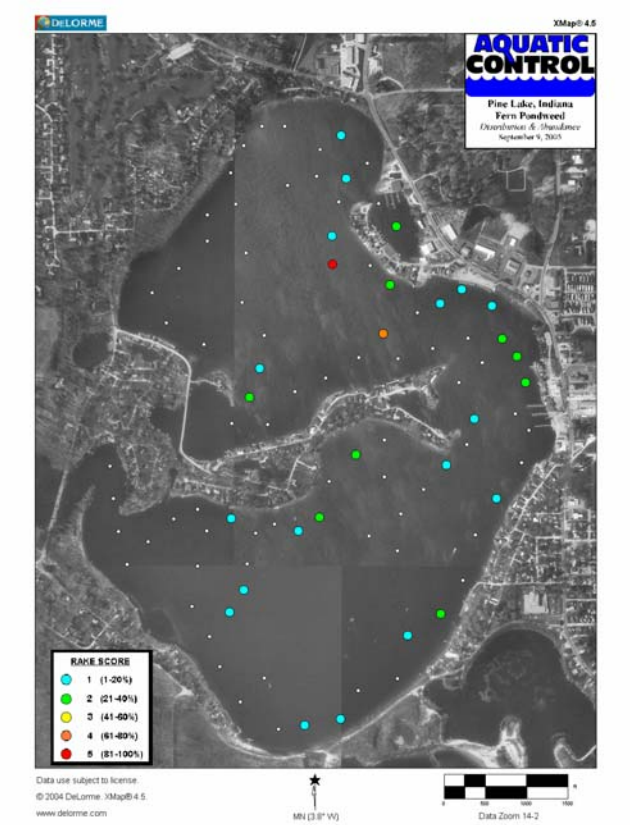


Figure 9. Pine Lake, Robbin's pondweed distribution and abundance, September 9, 2005.

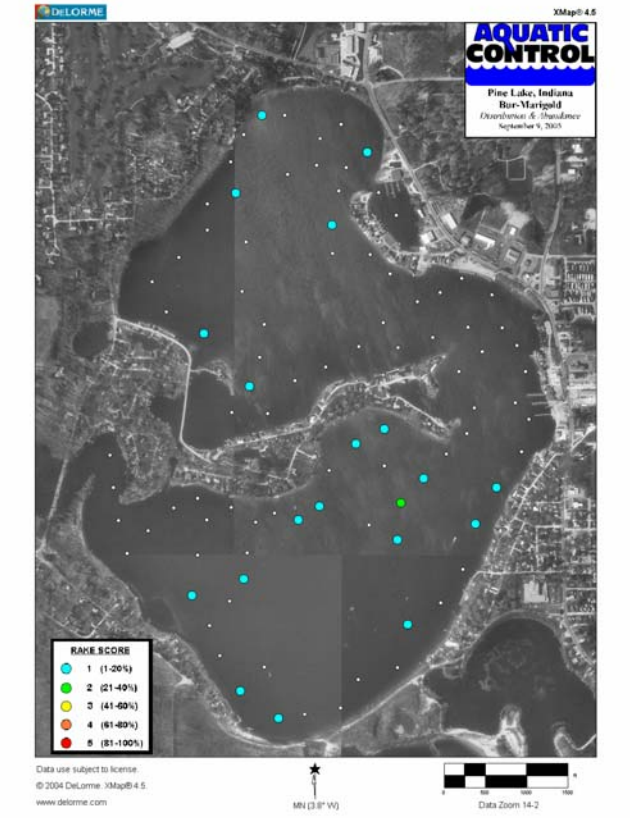


Figure 10. Pine Lake, bur-marigold distribution and abundance, September 9, 2005.

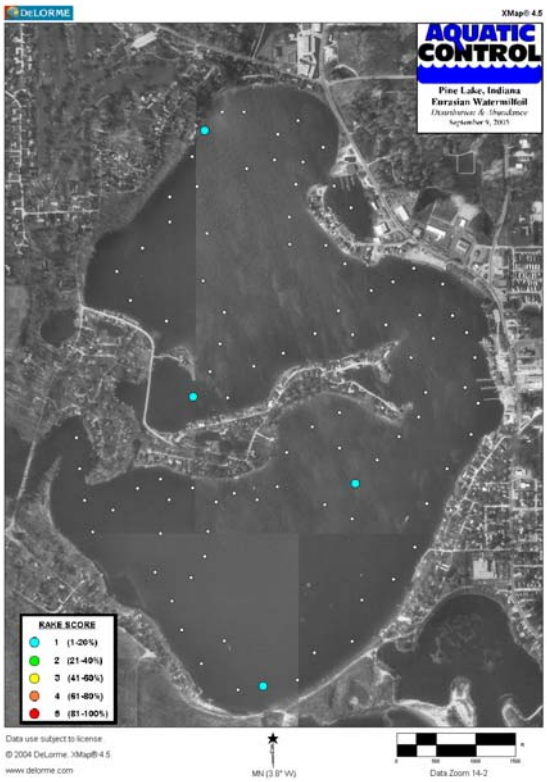


Figure 11. Pine Lake, Eurasian watermilfoil distribution and abundance, September 9, 2005.

Aquatic Vegetation Sampling Discussion

Pine Lake contains what may be one of the densest and most diverse plant communities in the state. The plant community has remained relatively stable over the last three sampling events as illustrated in Figures 12, 13, and 14. It is important to preserve this plant community for several reasons. This diverse plant community likely aids in fish production, slows the spread of invasive species, and stabilizes and improves the overall water quality of the lake.

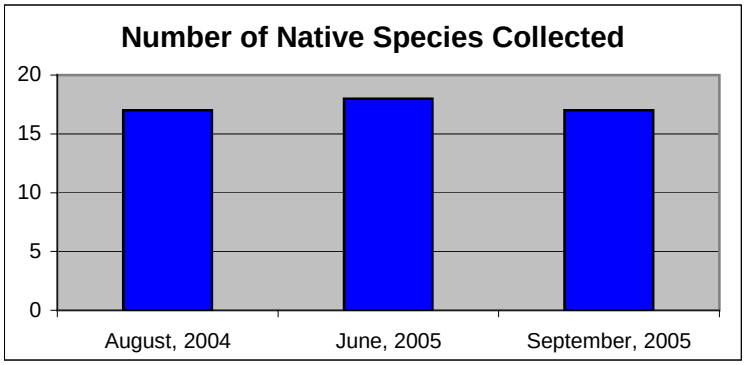


Figure 12. Pine Lake, comparison of number of native species collected in the last three surveys.

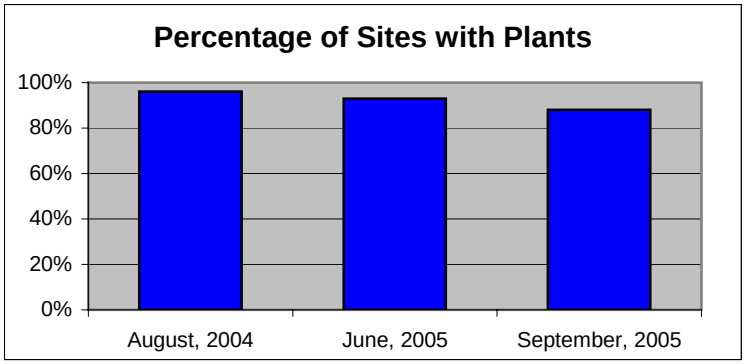


Figure 13. Pine Lake, comparison of the percentage of sample sites with plants in the last three surveys.

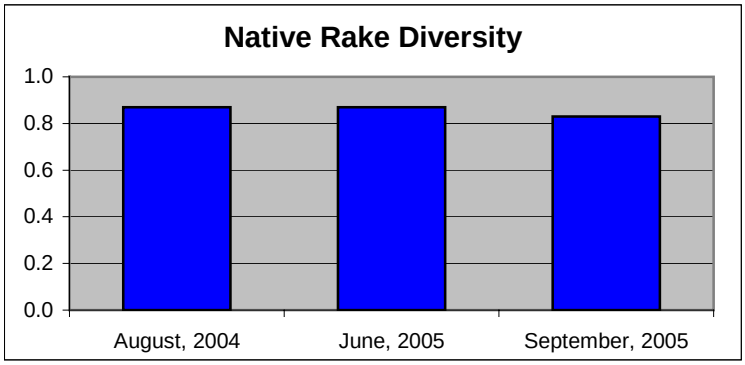


Figure 14. Pine Lake, comparison of native rake diversity in the last three surveys.

It appears that there continues to be a diverse plant community within Pine Lake, but there was a slight decrease in some of the density metrics reflected in the September survey. This is illustrated in Figure 15 that compares the mean rake scores from the last three surveys. It is not clear why this has occurred.

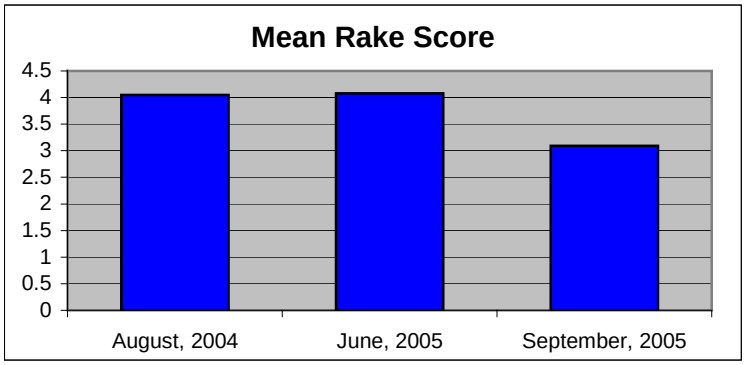


Figure 15. Pine Lake, comparison of the mean rake score in the last three surveys.

Three state imperiled plant species have been sampled in the last three surveys, Robbin's pondweed, Richardson's pondweed, and bur-marigold. It appears that Richardson's pondweed and bur-marigold have both significantly increased when compared to 2004 data (Figure 16 & 17), while Robbin's pondweed has slightly decreased (Figure 18).

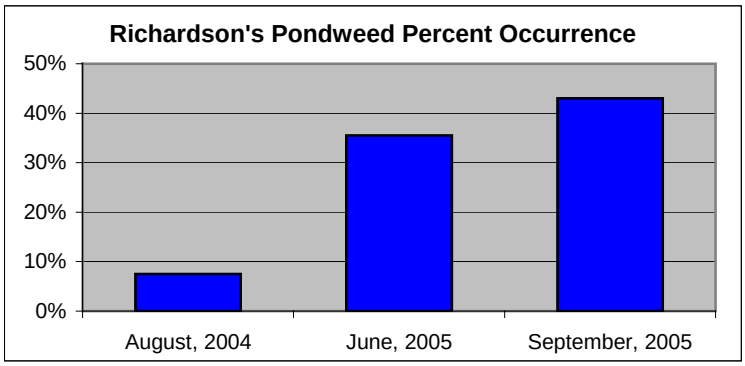


Figure 16. Pine Lake, comparison of Richardson's pondweed percent occurrence in the last three surveys.

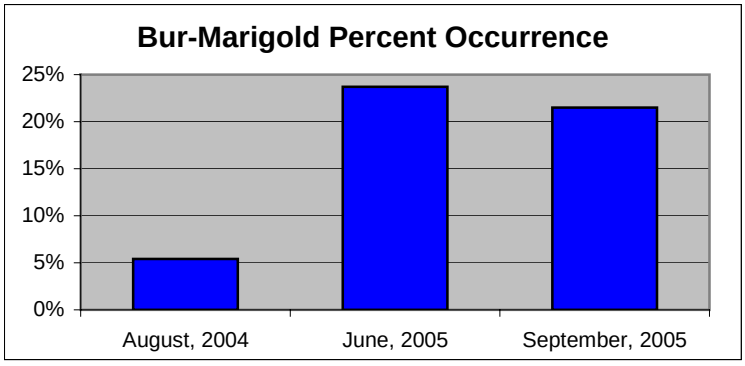


Figure 17. Pine Lake, comparison of bur-marigold percent occurrence in the last three surveys.

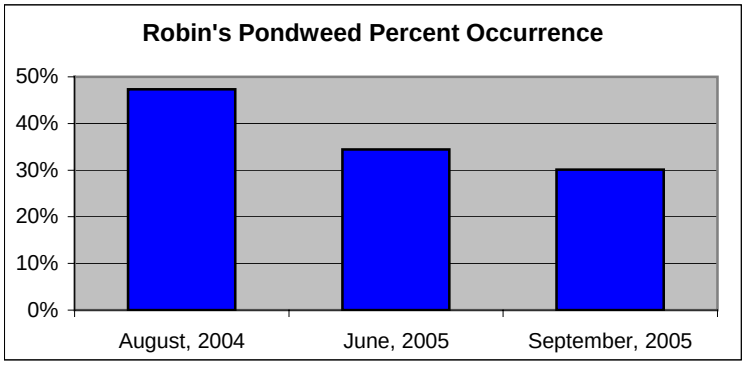


Figure 18. Pine Lake, comparison of Robbin's pondweed percent occurrence in the last three surveys.

Exotic submersed plant species have gained a foothold in Pine Lake despite the presence of a dense and diverse native community. The presence of such a diverse community has likely limited the expansion of exotic vegetation. In addition, selective control of Eurasian watermilfoil was initiated this season in order to prevent the spread of this invasive species. It appears that the controls were effective in reducing the abundance and density of Eurasian watermilfoil (Figures 19 & 20).

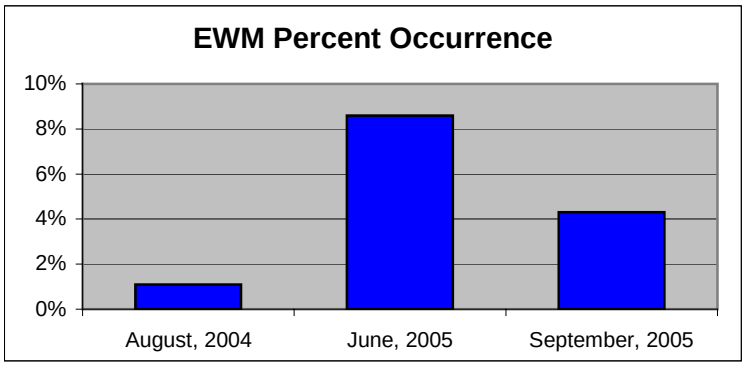


Figure 19. Pine Lake, comparison of Eurasian watermilfoil percent occurrence in the last three surveys.

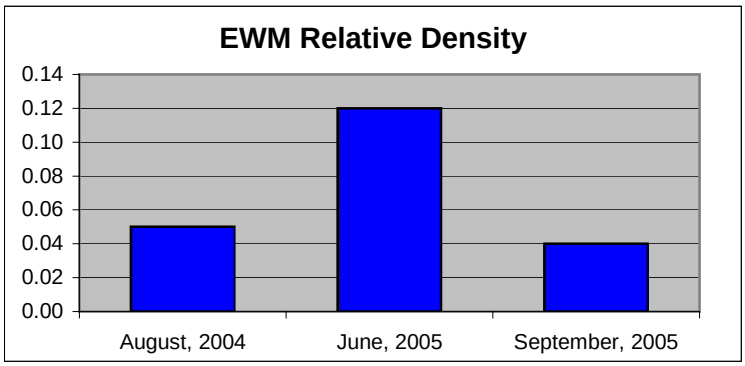


Figure 20. Pine Lake, comparison of Eurasian watermilfoil relative density in the last three surveys.

In 2004, there was only one tier II sampling event, which was completed in late summer. This sampling did not reflect the presence of the exotic species curlyleaf pondweed (curlyleaf pondweed typically reaches its maximum density in spring and dies off in early summer). This season's late spring sampling detected its presence, but at relatively low levels (Figure 21). It will be important to monitor and control this species in order to prevent its spread.

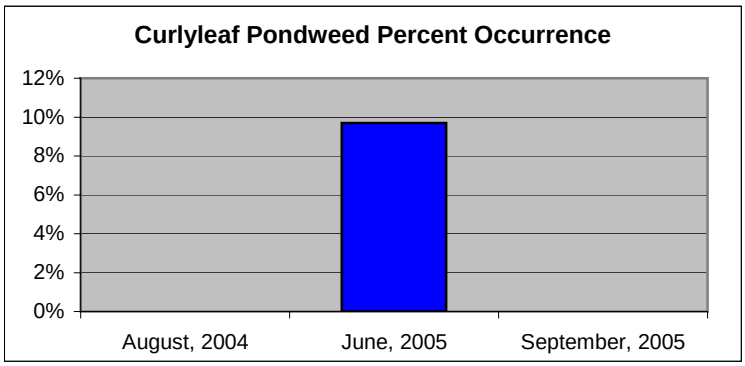


Figure 21. Pine Lake, comparison of curlyleaf pondweed percent occurrence in the last three surveys.

Future sampling should be completed in a similar manner for the next two seasons. This sampling will provide valuable information that can be used to effectively control nuisance species and preserve beneficial natives.

2005 VEGETATION CONTROL

Two different types of herbicide treatments were completed on Pine Lake during the 2005 season, non-selective contact treatments and selective systemic treatments. The contact treatments consisted of applying Aquathol herbicide to near-shore nuisance areas in the spring and Reward herbicide to the same areas in late summer. Contact treatments were completed on April 24 and July 21. A total of 16 acres were treated (Figure 21). Two return trips were made to touch up areas of poor control. The treatments effectively reduced nuisance conditions in the selected areas.

Figure 22. Pine Lake, 2005 contact herbicide treatment areas.

On July 21, 2005 a LARE funded selective treatment was completed using Renovate herbicide to control Eurasian watermilfoil. Treatment areas were selected after June sampling. Initially, a total of 14.5 acres were scheduled for treatment, but prior to the application it was determined that only 8.0 acres required treatment (Figure 22). The treatment was successful in controlling milfoil in these areas and reflected by the late summer sampling.

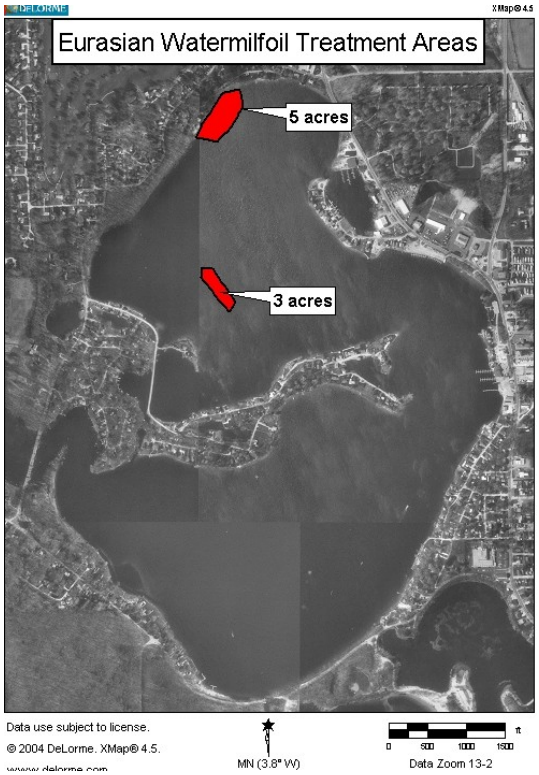


Figure 23. Pine Lake, Eurasian watermilfoil treatment areas.

ACTION PLAN AND BUDGET UPDATE

In 2005, the main plant management action initiated was treatment of Eurasian watermilfoil with Renovate herbicide. It was estimated that up to 20 acres would require treatment in 2005. However, only 8 acres actually required treatment. Eurasian watermilfoil is very difficult to predict, so it is recommended that the 15.0 acres should be tentatively planned for treatment next season. A brief visual survey should be completed in early spring in order to monitor curlyleaf pondweed abundance and help predict the actual acres of milfoil that may require treatment. If it appears there will be very little milfoil then funds should be used to treat curlyleaf pondweed in early spring (this is the best time to treat this species before it produces any reproductive structures). Along with the treatment it is important to continue with the sampling in the same manner that was completed this season. The Laporte Area Lake Association should request $9,775 for treatment and sampling updates for the 2006 season.

Table 4. Budget estimates for management options (reflects renovate application cost increase in 2006 and 2007)

	2005	2006	2007
Eurasian watermilfoil or curlyleaf pondweed application*	$8,000*	$6,375*	$4,250*
Herbicide & Application Cost	$12,000	$12,000	$12,000
Vegetation Sampling & Plan Update*	$3,400*	$3,400*	$3,400*
Total:	**$23,400***	**$21,775***	**$19,650***

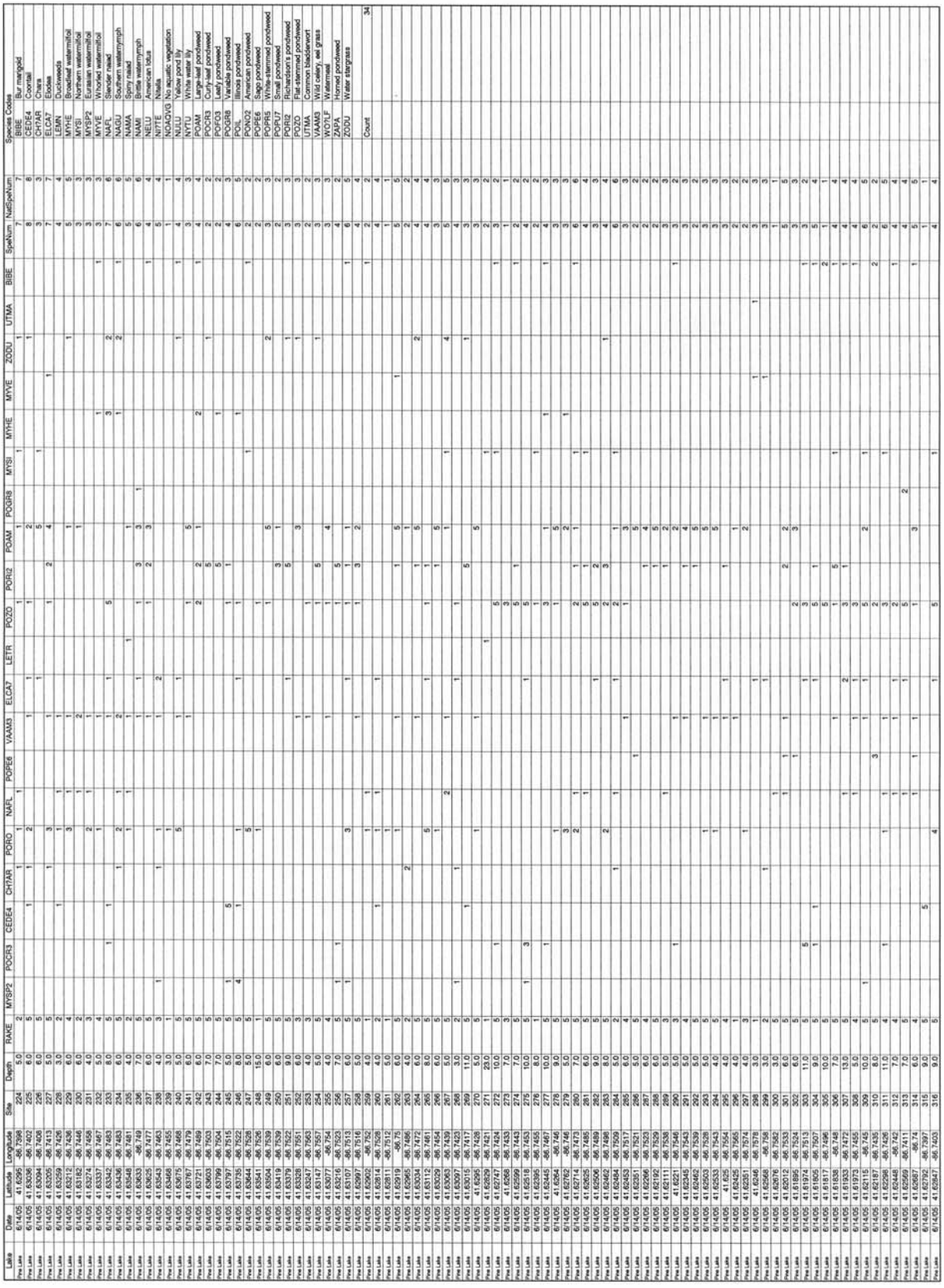
*Eligible for Lare Funding, Eurasian watermilfoil estimate based on treating 20 acres with triclopyr the first season (based on spring visual survey), with 15 acres in 2006 and 10 acres in 2007.

PUBLIC PARTICIPATION

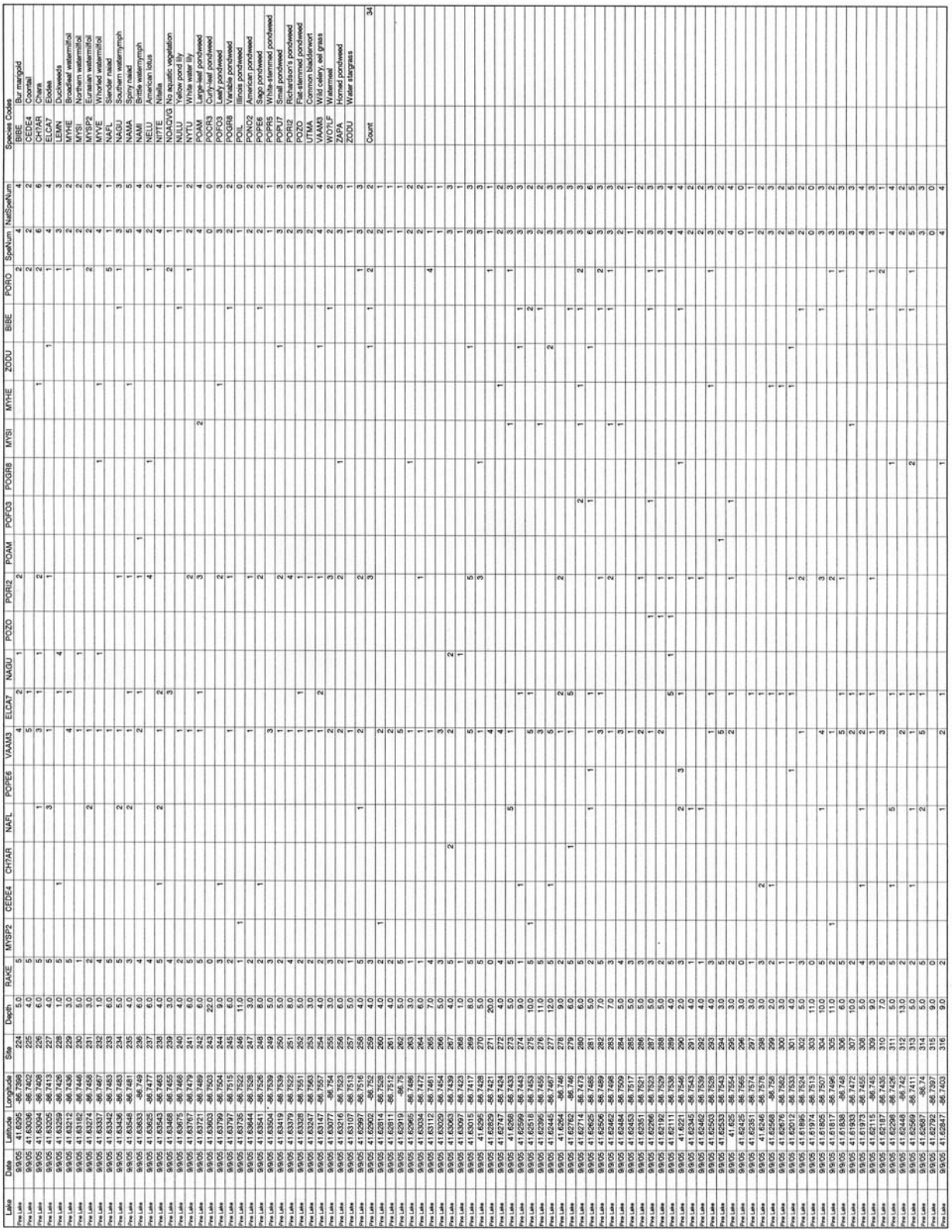
A public meeting was held on February 9, 2006 in order to gain input concerning the plan from lake users, educate lake users on the benefits of native vegetation, inform lake users about the 2005 vegetation controls, and to update lake users on 2006 plans. Aquatic Control's Brendan Hastie led the meeting. Nineteen individuals were in attendance and nine filled out a lake use survey form. The survey indicated that all respondents lived on Pine Lake and were members of the lake association. Boating was the most popular lake use followed by swimming and fishing. All respondents indicated that aquatic vegetation interferes with their use or enjoyment of the lake and were also in favor of continuing vegetation control efforts.

APPENDIX UPDATE-2005 SAMPLING DATA

June Tier II Survey



Lake	Date	Latitude	Longitude	Site	Depth	RAKE	MYSP2	POGR3	CEDE4	CHTAR	PORO	NAFL	POPE6	VAAM3	ELCA7	LETR	POZO	PORI2	POAM	POGR8	MYSI	MYHE	MYVE	ZODU	UTMA	BIBE	SpeNum	NatSpeNum	Species Codes
Pine Lake	6/14/05	41.6295	-86.7398	224	5.0	2					1	1						1							1		7	7	BIBE	Bur marigold
Pine Lake	6/14/05	41.63036	-86.7402	225	6.0	5				1	1	2				1				2		1			1		8	6	CEDE4	Coontail
Pine Lake	6/14/05	41.63094	-86.7406	226	6.0	5					1				1				5			1					3	3	CHTAR	Chara
Pine Lake	6/14/05	41.63205	-86.7413	227	5.0	2				1		3			1			2	4					1			7	7	ELCA7	Elodea
Pine Lake	6/14/05	41.63259	-86.7426	228	3.0	2				1		1			1												4	4	LEMN	Duckweeds
Pine Lake	6/14/05	41.63212	-86.7436	229	6.0	4						3	1		2				1						1		5	5	MYHE	Broadleaf watermilfoil
Pine Lake	6/14/05	41.63212	-86.7446	230	6.0	2							1						1								3	3	MYSI	Northern watermilfoil
Pine Lake	6/14/05	41.63274	-86.7456	231	4.0	3						2	1		1												3	3	MYSP2	Eurasian watermilfoil
Pine Lake	6/14/05	41.63337	-86.7467	232	5.0	4						1			1								1			1	3	3	MYVE	Whorled watermilfoil
Pine Lake	6/14/05	41.63342	-86.7483	233	8.0	5		1				1			1		5						3		2		7	6	NAFL	Slender naiad
Pine Lake	6/14/05	41.63436	-86.7483	234	6.0	5			1		1	2			2								1		2		6	6	NAGU	Southern waternymph
Pine Lake	6/14/05	41.63548	-86.7481	235	4.0	2					1	1				1			1			1					5	5	NAMA	Spiny naiad
Pine Lake	6/14/05	41.63633	-86.749	236	7.0	5									1	1		3	3	1							6	6	NAMI	Brittle waternymph
Pine Lake	6/14/05	41.63625	-86.7477	237	6.0	5						1			1			1	2	3		1					4	4	NELU	American lotus
Pine Lake	6/14/05	41.63543	-86.7463	238	4.0	3	1			1					2												5	4	NIJTE	Naiaia
Pine Lake	6/14/05	41.63466	-86.7455	239	3.0	1					1				1												1	1	NOAQVG	No aquatic vegetation
Pine Lake	6/14/05	41.63675	-86.7466	240	5.0	5					5								5						1		4	4	NUJU	Yellow pond lily
Pine Lake	6/14/05	41.63797	-86.7479	241	6.0	5								1	1		2						2			1	3	3	NYTU	White water lily
Pine Lake	6/14/05	41.63737	-86.7469	242	6.0	5							1					2	1						1		4	4	POAM	Large leaf pondweed
Pine Lake	6/14/05	41.63603	-86.7503	243	7.0	5																					2	2	POCR3	Curly-leaf pondweed
Pine Lake	6/14/05	41.63799	-86.7504	244	7.0	5												5	1				1				2	2	POFO3	Leafy pondweed
Pine Lake	6/14/05	41.63797	-86.7515	245	5.0	5		1								1		1									4	3	POGR8	Variable pondweed
Pine Lake	6/14/05	41.63735	-86.7522	246	8.0	5		4			1				1								1				6	5	POIL	Illinois pondweed
Pine Lake	6/14/05	41.63644	-86.7528	247	5.0	5															1						2	2	PONO2	American pondweed
Pine Lake	6/14/05	41.63541	-86.7526	248	15.0	1					1								5						2		2	2	POPE6	Sago pondweed
Pine Lake	6/14/05	41.63504	-86.7539	249	6.0	5						5					1										3	3	POPR5	White-stemmed pondweed
Pine Lake	6/14/05	41.63419	-86.7539	250	6.0	5									1			3	1								2	2	POPU7	Small pondweed
Pine Lake	6/14/05	41.63379	-86.7522	251	9.0	3												5							1		3	3	PORI2	Richardson's pondweed
Pine Lake	6/14/05	41.63328	-86.7551	252	6.0	3									1				3						1		3	3	PRZO	Flat-stemmed pondweed
Pine Lake	6/14/05	41.63347	-86.7563	253	4.0	3									1		1										2	2	PUTA	Common bladderwort
Pine Lake	6/14/05	41.63344	-86.7575	254	6.0	5									1		1	5	1						1		3	3	VAAM3	Wild celery, eel grass
Pine Lake	6/14/05	41.63077	-86.754	255	4.0	4														4							3	3	WOTLF	Watermeal
Pine Lake	6/14/05	41.63216	-86.7523	256	7.0	5	1	1							1		1	5	1	1		1					6	5	ZAPA	Horned pondweed
Pine Lake	6/14/05	41.63107	-86.7513	257	6.0	5	1				3						1	1	1	1					2		4	4	ZODU	Water stargrass
Pine Lake	6/14/05	41.62997	-86.7516	258	5.0	5									1		1	3	2								4	4		
Pine Lake	6/14/05	41.62902	-86.752	259	4.0	1					1		1												1		2	2	Count	34
Pine Lake	6/14/05	41.62814	-86.7528	260	4.0	2			1		1		1														4	4		
Pine Lake	6/14/05	41.62811	-86.7512	261	5.0	1					1				1												1	1		
Pine Lake	6/14/05	41.62919	-86.75	262	6.0	1					1						1		5					1			5	5		
Pine Lake	6/14/05	41.62965	-86.7486	263	4.0	2				2					1			1	1	5						2	2		
Pine Lake	6/14/05	41.63034	-86.7472	264	6.0	5								1			1	1	1						2		4	4		
Pine Lake	6/14/05	41.63112	-86.7454	265	6.0	5						5			1		1	1	1	5							3	3		
Pine Lake	6/14/05	41.63032	-86.7454	266	6.0	5						1				1				1							5	5		
Pine Lake	6/14/05	41.63063	-86.7439	267	5.0	5							2		1							1			4		5	5		
Pine Lake	6/14/05	41.63097	-86.7423	268	3.0	2	1			1					1		1										4	3		
Pine Lake	6/14/05	41.63015	-86.7417	269	11.0	5			1									5							1		3	3		
Pine Lake	6/14/05	41.6295	-86.7428	270	5.0	5					1				1					5							3	3		
Pine Lake	6/14/05	41.62829	-86.7421	271	23.0	1										1						1					2	2		
Pine Lake	6/14/05	41.62747	-86.7424	272	10.0	5		1									5					1					3	2		
Pine Lake	6/14/05	41.6268	-86.7433	273	7.0	3											3										1	1		
Pine Lake	6/14/05	41.62599	-86.7443	274	7.0	5									1		5	1				1					2	2		
Pine Lake	6/14/05	41.62518	-86.7453	275	10.0	5	1	3									5										2	2		
Pine Lake	6/14/05	41.62435	-86.7465	276	10.0	5									1		3					1					4	2		
Pine Lake	6/14/05	41.62454	-86.7481	277	10.0	5		1				1					5			5			1				4	2		
Pine Lake	6/14/05	41.6264	-86.746	278	9.0	5											2	1		2		1					3	3		
Pine Lake	6/14/05	41.62762	-86.746	279	5.0	5											5	1		1		1					3	3		
Pine Lake	6/14/05	41.62714	-86.7478	280	7.0	5											2	1		1		1					6	6		
Pine Lake	6/14/05	41.62625	-86.7485	281	6.0	5											5	1		1		1					4	4		
Pine Lake	6/14/05	41.62596	-86.7489	282	9.0	5											5	2		2		1					3	3		
Pine Lake	6/14/05	41.62462	-86.7498	283	8.0	5											5	1		3		1					4	4		
Pine Lake	6/14/05	41.62484	-86.7509	284	5.0	2											2	1		1		1					6	6		
Pine Lake	6/14/05	41.62453	-86.7517	285	6.0	4											2			3							3	3		
Pine Lake	6/14/05	41.62351	-86.7521	286	5.0	2											1			5							2	2		
Pine Lake	6/14/05	41.62266	-86.7533	287	6.0	4														4							2	2		
Pine Lake	6/14/05	41.62192	-86.7539	288	6.0	5														5							2	2		
Pine Lake	6/14/05	41.62111	-86.7538	289	5.0	3														3							2	2		
Pine Lake	6/14/05	41.6221	-86.7546	290	5.0	3														2							3	2		
Pine Lake	6/14/05	41.62345	-86.7543	291	5.0	4														4							3	2		
Pine Lake	6/14/05	41.62462	-86.7539	292	5.0	5														5							2	2		
Pine Lake	6/14/05	41.62503	-86.7528	293	5.0	5														5							3	3		
Pine Lake	6/14/05	41.6253	-86.7543	294	4.0	5														5							3	3		
Pine Lake	6/14/05	41.625	-86.7554	295	4.0	4														4							3	3		
Pine Lake	6/14/05	41.62425	-86.7565	296	4.0	1														1							2	2		
Pine Lake	6/14/05	41.62351	-86.7574	297	4.0	3														3							2	2		
Pine Lake	6/14/05	41.6246	-86.7578	298	3.0	1														2							3	3		
Pine Lake	6/14/05	41.62566	-86.756	299	3.0	2																1					3	3		
Pine Lake	6/14/05	41.62676	-86.7563	300	3.0	5																1					3	3		
Pine Lake	6/14/05	41.62822	-86.7553	301	4.0	5																1					3	3		
Pine Lake	6/14/05	41.61895	-86.7524	302	6.0	5																1					1	1		
Pine Lake	6/14/05	41.61974	-86.7513	303	11.0	5																1				1	5	4		
Pine Lake	6/14/05	41.61805	-86.7507	304	9.0	5																1				1	5	4		
Pine Lake	6/14/05	41.61817	-86.7496	305	10.0	5																2					1	1		
Pine Lake	6/14/05	41.61838	-86.748	306	7.0	5																1					4	4		
Pine Lake	6/14/05	41.61933	-86.7472	307	13.0	5																1					4	4		
Pine Lake	6/14/05	41.61973	-86.7455	308	5.0	4																1					4	4		
Pine Lake	6/14/05	41.62115	-86.745	309	10.0	5																1					6	5		
Pine Lake	6/14/05	41.62187	-86.7436	310	8.0	5																1					2	2		
Pine Lake	6/14/05	41.62298	-86.7426	311	11.0	4																1					6	5		
Pine Lake	6/14/05	41.62548	-86.742	312	7.0	4																1					4	4		
Pine Lake	6/14/05	41.62792	-86.7397	313	7.0	4																1					5	5		
Pine Lake	6/14/05	41.62607	-86.74	314	6.0	4																1					5	5		
Pine Lake	6/14/05	41.62847	-86.7403	316	9.0	5																1					4	4		



Lake	Date	Latitude	Longitude	Site	Depth	RAKE	MYSP2	CEDE4	CH7AR	NAFL	POPE6	VAAM3	ELCA7	NAGU	POZO	PORI2	POAM	POFO3	POGR8	MYSI	MYHE	ZODU	BIBE	PORO	SpeNum	NatSpeNum	Species Codes
Pine Lake	9/9/05	41.6295	-86.7396	224	5.0	5							4	2			2							2	4	4	BIBE Bur mangold
Pine Lake	9/9/05	41.63036	-86.7402	225	4.0	5						5	1	1										2	2	2	CEDE4 Coontail
Pine Lake	9/9/05	41.63094	-86.7408	226	6.0	5				1		3	1	1		2						1		2	6	6	CH7AR Chara
Pine Lake	9/9/05	41.63205	-86.7413	227	4.0	5				3		1	1			1							1		4	4	ELCA7 Elodea
Pine Lake	9/9/05	41.63259	-86.7426	228	1.0	5			1					4									1		3	3	LEMN Duckweeds
Pine Lake	9/9/05	41.63212	-86.7436	229	3.0	5						4	1												2	2	MYHE Brazilian watermilfoil
Pine Lake	9/9/05	41.63182	-86.7446	230	5.0	1						1		1											2	2	MYSI Northern watermilfoil
Pine Lake	9/9/05	41.63274	-86.7458	231	3.0	2					2	1												2	2	2	MYSP2 Eurasian watermilfoil
Pine Lake	9/9/05	41.63337	-86.7467	232	1.0	4						1		1					1			1			4	4	MYVE Whorled watermilfoil
Pine Lake	9/9/05	41.63342	-86.7483	233	6.0	5																		5	1	1	NAFL Slender naid
Pine Lake	9/9/05	41.63436	-86.7483	234	5.0	5					2		1			1						1		1	3	3	NAGU Southern waternymph
Pine Lake	9/9/05	41.63548	-86.7481	235	4.0	3					2		1			1									5	5	NAMA Spiny naid
Pine Lake	9/9/05	41.63625	-86.7477	237	6.0	4							2			4								1	4	2	NELU American lotus
Pine Lake	9/9/05	41.63543	-86.7463	238	4.0	5		1		2						1								2	4	4	NITE Nitella
Pine Lake	9/9/05	41.63468	-86.7455	239	3.0	4								3										2	1	1	NOAQVG No aquatic vegetation
Pine Lake	9/9/05	41.63675	-86.7468	240	4.0	2						1											1		1	1	NULU Yellow pond lily
Pine Lake	9/9/05	41.63767	-86.7479	241	6.0	5						1		1			2				2			1	2	2	NYTU White water lily
Pine Lake	9/9/05	41.63721	-86.7489	242	6.0	5						1					3								4	4	POAM Large-leaf pondweed
Pine Lake	9/9/05	41.63603	-86.7503	243	22.0	0																			0	0	POCR3 Curly-leaf pondweed
Pine Lake	9/9/05	41.63799	-86.7504	244	9.0	3			1							2						1			3	3	POFO3 Leafy pondweed
Pine Lake	9/9/05	41.63797	-86.7515	245	11.0	2							1			1							1		2	2	POGR8 Variable pondweed
Pine Lake	9/9/05	41.63735	-86.7532	246	11.0	2	1																		0	0	POIL Illinois pondweed
Pine Lake	9/9/05	41.63644	-86.7528	247	3.0	2										1								2	2	2	PONO2 American pondweed
Pine Lake	9/9/05	41.63541	-86.7526	248	8.0	2		1								2							1	2	2	2	POPE6 Sago pondweed
Pine Lake	9/9/05	41.63504	-86.7539	249	5.0	3						3				1						1		1	3	3	POPR5 White-stemmed pondweed
Pine Lake	9/9/05	41.63419	-86.7539	250	5.0	2						1				2								3	3	3	POPU7 Small pondweed
Pine Lake	9/9/05	41.63379	-86.7522	251	8.0	4						1				4							1		2	2	PORI2 Richardson's pondweed
Pine Lake	9/9/05	41.63328	-86.7551	252	5.0	2						1		1		1									3	3	POZO Flat-stemmed pondweed
Pine Lake	9/9/05	41.63247	-86.7563	253	3.0	2						1				1									2	2	UTMA Common bladderwort
Pine Lake	9/9/05	41.63147	-86.7557	254	4.0	2						1		2		1						1			4	4	VAAM3 Wild celery, eel grass
Pine Lake	9/9/05	41.63077	-86.754	255	3.0	3						2				3						1			2	2	WOTLF Watermeal
Pine Lake	9/9/05	41.63216	-86.7523	256	6.0	2						2				2			1						3	3	ZAPA Horned pondweed
Pine Lake	9/9/05	41.63107	-86.7513	257	5.0	1						2													1	1	ZODU Water stargrass
Pine Lake	9/9/05	41.62997	-86.7516	258	4.0	5				1							2						1	2	3	3	
Pine Lake	9/9/05	41.62972	-86.7532	259	4.0	3							2				3						1	2	2	2	Count 34
Pine Lake	9/9/05	41.62914	-86.7538	260	4.0	2	1								1										1	1	
Pine Lake	9/9/05	41.63011	-86.7512	261	4.0	2									1										1	1	
Pine Lake	9/9/05	41.62919	-86.75	262	5.0	5							2												2	2	
Pine Lake	9/9/05	41.62965	-86.7486	263	3.0	1							5						1						2	2	
Pine Lake	9/9/05	41.63034	-86.7472	264	6.0	1							1				1								2	2	
Pine Lake	9/9/05	41.63112	-86.7461	265	7.0	4							1				1						4		1	1	
Pine Lake	9/9/05	41.63029	-86.7454	266	5.0	3							3												1	1	
Pine Lake	9/9/05	41.63063	-86.7439	267	4.0	5							2		2										3	3	
Pine Lake	9/9/05	41.63097	-86.7423	268	1.0	1				2					1										1	1	
Pine Lake	9/9/05	41.63015	-86.7417	269	8.0	5							5			5									3	3	
Pine Lake	9/9/05	41.6295	-86.7426	270	5.0	5							1			3									3	3	
Pine Lake	9/9/05	41.62829	-86.7421	271	20.0	0							4						1						1	1	
Pine Lake	9/9/05	41.62747	-86.7434	272	4.0	4							4					1							2	2	
Pine Lake	9/9/05	41.62647	-86.7443	273	4.0	4							1												2	2	
Pine Lake	9/9/05	41.62599	-86.7443	274	9.0	1				5								1							3	3	
Pine Lake	9/9/05	41.62518	-86.7453	275	10.0	5		1				5		1											3	3	
Pine Lake	9/9/05	41.62396	-86.7455	276	11.0	5						5								1					2	2	
Pine Lake	9/9/05	41.62445	-86.7467	277	12.0	5		1					1												3	3	
Pine Lake	9/9/05	41.6264	-86.746	278	9.0	2							2			2									3	3	
Pine Lake	9/9/05	41.62762	-86.7485	279	6.0	5			1				1					2							3	3	
Pine Lake	9/9/05	41.62714	-86.7473	280	6.0	5							5					1							3	3	
Pine Lake	9/9/05	41.62625	-86.7485	281	5.0	2				1		1	1	1		1						1			6	6	
Pine Lake	9/9/05	41.62506	-86.7489	282	7.0	5					1	3	1												3	3	
Pine Lake	9/9/05	41.62462	-86.7498	283	7.0	3						1				1				1		1			3	3	
Pine Lake	9/9/05	41.62464	-86.7509	284	5.0	4						3				1				1					2	2	
Pine Lake	9/9/05	41.62453	-86.7517	285	5.0	3						1				2									2	2	
Pine Lake	9/9/05	41.62456	-86.7531	286	5.0	3						1	2		1		1								2	2	
Pine Lake	9/9/05	41.62256	-86.7523	287	5.0	3						1			1										2	2	
Pine Lake	9/9/05	41.62192	-86.7529	288	5.0	2							2		1			1							3	3	
Pine Lake	9/9/05	41.62111	-86.7538	289	4.0	5													1						4	4	
Pine Lake	9/9/05	41.6221	-86.7546	290	2.0	3					3		5	1	1	1									0	0	
Pine Lake	9/9/05	41.62345	-86.7543	291	4.0	1							1				1								1	1	
Pine Lake	9/9/05	41.62462	-86.7539	292	4.0	1					1						1								2	2	
Pine Lake	9/9/05	41.62503	-86.7528	293	4.0	3							1				1						1		3	3	
Pine Lake	9/9/05	41.62533	-86.7543	294	3.0	5							5					1							2	2	
Pine Lake	9/9/05	41.625	-86.7554	295	3.0	2							2			1									4	4	
Pine Lake	9/9/05	41.62425	-86.7565	296	3.0	0												1							0	0	
Pine Lake	9/9/05	41.62351	-86.7574	297	3.0	1							1												1	1	
Pine Lake	9/9/05	41.6246	-86.7576	298	3.0	3			2				1												2	2	
Pine Lake	9/9/05	41.62568	-86.758	299	2.0	2			1				1						1						3	3	
Pine Lake	9/9/05	41.62679	-86.7582	300	3.0	1							1						1						2	2	
Pine Lake	9/9/05	41.62611	-86.7573	301	3.0	1							1												1	1	
Pine Lake	9/9/05	41.61895	-86.7524	302	5.0	3					1														2	2	
Pine Lake	9/9/05	41.61974	-86.7513	303	11.0	0																			0	0	
Pine Lake	9/9/05	41.61805	-86.7507	304	10.0	5				1			4			3								1	3	3	
Pine Lake	9/9/05	41.61817	-86.7496	305	11.0	2										2								1	3	2	
Pine Lake	9/9/05	41.61838	-86.748	306	6.0	5							5			1								1	3	3	
Pine Lake	9/9/05	41.61933	-86.7472	307	10.0	2							2			1									3	3	
Pine Lake	9/9/05	41.61973	-86.7455	308	5.0	4				1			2												4	4	
Pine Lake	9/9/05	41.62115	-86.745	309	9.0	3		1					1												3	3	
Pine Lake	9/9/05	41.62187	-86.7435	310	7.0	5							3												1	1	
Pine Lake	9/9/05	41.62298	-86.7426	311	5.0	5		1						1						1					4	4	
Pine Lake	9/9/05	41.62448	-86.742	312	13.0	2							2	1											2	2	
Pine Lake	9/9/05	41.62569	-86.7411	313	5.0	2		1					1	1						2					5	5	
Pine Lake	9/9/05	41.62714	-86.7414	314	5.0	2				1			1	1											5	4	
Pine Lake	9/9/05	41.62792	-86.7397	315	9.0	5				2			5	1											3	3	
Pine Lake	9/9/05	41.62847	-86.7403	316	9.0	2				1			2	1						1					0	0	
																									4	4	

APPENDIX UPDATE-VEGETATION CONTROL PERMIT APPLICATION

APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT
State Form 26727 (R / 11-03)
Approved State Board of Accounts 1987
☐ Whole Lake ☒ Multiple Treatment Areas
Check type of permit

INSTRUCTIONS: Please print or type information

FOR OFFICE USE ONLY
License No.
Date Issued
Lake County

Return to: Page 1 of 6
DEPARTMENT OF NATURAL RESOURCES
Division of Fish and Wildlife
Commercial License Clerk
402 West Washington Street, Room W273
Indianapolis, IN 46204

FEE: $5.00

Applicant's Name	Lake Assoc. Name	
Laporte Area Lake Association	Laporte Area Lake Association	
Rural Route or Street		Phone Number
328 Oak Drive		219-324-2058
City and State		ZIP Code
Laporte, IN		46350
Certified Applicator (if applicable)	Company or Inc. Name	Certification Number
Rural Route or Street		Phone Number
City and State		ZIP Code

Lake (One application per lake)	Nearest Town	County
Pine Lake	Laporte	Laporte
Does water flow into a water supply		☐ Yes ☒ No

Please complete one section for *EACH* treatment area. Attach lake map showing treatment area and denote location of any water supply intake.

Treatment Area # 1	LAT/LONG or UTM's Center of Bed at N41.62540 W86.75016		
Total acres to be controlled 8	Proposed shoreline treatment length (ft) 5700	Perpendicular distance from shoreline (ft) 50	
Maximum Depth of Treatment (ft) 6	Expected date(s) of treatment(s) May 24 and July 11 (subject to minor change depending on weather)		
Treatment method: ☒ Chemical ☐ Physical	☐ Biological Control	☐ Mechanical	

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward & Nautique for submersed veg., renovate may be used for some selective milfoil, and aquathol for clp.

Plant survey method: ☒ Rake ☒ Visual ☐ Other (specify)

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Robbin's pondweed		15
Slender Naiad	x	12
Eel Grass	x	20
Variable Leaf Pondweed		3
Large Leaf Pondweed		30
Coontail	x	4
Richardson's Pondweed		1
Northern Watermilfoil	x	6
Flatstem Pondweed	x	1
Bur Marigold		3
Chara spp.	x	1
Water Stargrass	x	1
Elodea	x	3

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Treatment Area # 2	LAT/LONG or UTM's Center of Bed at N41.62819 W86.74947		
Total acres to be controlled 5.5	Proposed shoreline treatment length (ft) 3500	Perpendicular distance from shoreline (ft) 50-100	
Maximum Depth of Treatment (ft) 6	Expected date(s) of treatment(s) May 24 and July 11 (subject to minor change depending on weather)		
Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical			
Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward & Nautique for submersed veg., renovate may be used for some selective milfoil, and aquathol for clp.			
Plant survey method: [X] Rake [ ] Visual [ ] Other (specify)			

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Coontail	x	7
Robbin's pondweed		18
Eurasian watermilfoil	x	9
Northern watermilfoil	x	6
Eel Grass	x	11
Large Leaf Pondweed		42
Water Stargrass	x	2
Variable Leaf Pondweed		2
Elodea	x	3

Treatment Area # 3	LAT/LONG or UTM's Center of Bed @ N41.6302 W86.75599		
Total acres to be controlled 1	Proposed shoreline treatment length (ft) 700	Perpendicular distance from shoreline (ft) 50-100	
Maximum Depth of Treatment (ft) 6	Expected date(s) of treatment(s) May 24 and July 11 (subject to minor change depending on weather)		
Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical			
Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward & Nautique for submersed veg., renovate may be used for some selective milfoil, and aquathol for clp.			
Plant survey method: [X] Rake [ ] Visual [ ] Other (specify)			

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Robbin's pondweed		30
Slender Naiad	x	15
Northern Watermilfoil	x	15
Water Stargrass	x	3
Eel Grass	x	16
Variable Leaf Pondweed		2
Elodea	x	4
Coontail	X	10
Largeleaf pondweed		5

Treatment Area #	4	LAT/LONG or UTM's	Center of bed @ N41.63868 W86.75025		
Total acres to be controlled	2.5	Proposed shoreline treatment length (ft)	1500	Perpendicular distance from shoreline (ft)	50-100
Maximum Depth of Treatment (ft)	6	Expected date(s) of treatment(s)	May 24 and July 11 (subject to minor change depending on weather)		

Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward & Nautique for submersed veg., renovate may be used for some selective milfoil, and aquathol for clp.

Plant survey method: [X] Rake [ ] Visual [ ] Other (specify)

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Robbin's pondweed		19
Eel Grass	x	8
Variable Leaf Pondweed	x	2
Water Stargrass	x	13
Elodea	x	10
Large Leaf Pondweed		21
Coontail	x	4
Northern Watermilfoil	x	8
Slender Naiad	x	1
Southern water nymph	x	14

Treatment Area #	5	LAT/LONG or UTM's	Center of bed @ N41.63323 W86.74611		
Total acres to be controlled	2	Proposed shoreline treatment length (ft)	1500	Perpendicular distance from shoreline (ft)	50-100
Maximum Depth of Treatment (ft)	6	Expected date(s) of treatment(s)	Late May and Late June or Early July		

Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward & Nautique for submersed veg., renovate may be used for some selective milfoil, and aquathol for clp.

Plant survey method: [X] Rake [ ] Visual [ ] Other (specify)

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Slender Naiad	x	5
Sago Pondweed	x	6
Robbin's pondweed		5
Elodea	x	11
Eel Grass	x	11
Large Leaf Pondweed		35
Northern watermilfoil	x	23
Coontail	x	3
Water Stargrass	x	1

Treatment Area # 6	LAT/LONG or UTM's Center of bed @ N41.62390 W86.74135		
Total acres to be controlled 3.5	Proposed shoreline treatment length (ft) 2000	Perpendicular distance from shoreline (ft) 50-100	
Maximum Depth of Treatment (ft) 6	Expected date(s) of treatment(s) May 24 and July 11 (subject to minor change depending on weather)		
Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical			
Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward & Nautique for submersed veg., renovate may be used for some selective milfoil, and aquathol for clp.			
Plant survey method: [X] Rake [ ] Visual [ ] Other (specify)			

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Robbin's		9
Eel Grass	x	8
Variable Leaf Pondweed		17
Water Stargrass	x	13
Elodea	x	10
Large Leaf Pondweed		16
Coontail	x	4
Northern Watermilfoil	x	8
Slender Naiad	x	1
Southern water nymph	x	14

Treatment Area # 7	LAT/LONG or UTM's Center of bed @ N41.619935 W86.75406		
Total acres to be controlled 2	Proposed shoreline treatment length (ft) 9000	Perpendicular distance from shoreline (ft) 50	
Maximum Depth of Treatment (ft) 6	Expected date(s) of treatment(s) May 24 and July 11 (subject to minor change depending on weather)		
Treatment method: [X] Chemical [ ] Physical [ ] Biological Control [ ] Mechanical			
Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Reward & Nautique for submersed veg., renovate may be used for some selective milfoil, and aquathol for clp.			
Plant survey method: [X] Rake [ ] Visual [ ] Other (specify)			

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Robbin's Pondweed		20
Large Leaf Pondweed		25
Slender Naiad	x	6
Broadleaf watermilfoil		1.5
Eel Grass	x	15
Elodea	x	3
Variable Leaf Pondweed		4
Northern Watermilfoil	x	17
Richardson's Pondweed		4
Coontail	x	1.5
Water Stargrass	x	1.5
Flat-stemmed Pondweed	x	1.5

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Treatment Area # 8	LAT/LONG or UTM's Maximum of 20 acres of EWM where it occurs (see avmp, area determined following spring survey)	
Total acres to be controlled	Proposed shoreline treatment length (ft)	Perpendicular distance from shoreline (ft)
Maximum Depth of Treatment (ft)	Expected date(s) of treatment(s) Late May	

Treatment method: ☐ Chemical ☐ Physical ☐ Biological Control ☐ Mechanical

Based on treatment method, describe chemical used, method of physical or mechanical control and disposal area, or the species and stocking rate for biological control. Renovate herbicide for selective control of EWM & low dose aquathol for curlyleaf wherever it occurs

Plant survey method: ☒ Rake ☐ Visual ☐ Other (specify) Data collected during June, 2005 Tier II

Aquatic Plant Name	Check if Target Species	Relative Abundance % of Community
Flatstem pondweed		10
Largeleaf pondweed		10
Eel Grass		10
Richardson's pondweed		10
Robbin's pondweed		10
Elodea		10
Bur-marigold		10
Slender naiad		5
Water stargrass		5
Northern watermilfoil		5
Coontail		5
Curlyleaf pondweed	x	5
Chara		5
Eurasian watermilfoil	x	5
Sago pondweed		5

INSTRUCTIONS: Whoever treats the lake fills in "Applicant's Signature" unless they are a professional. If they are a professional company who specializes in lake treatment, they should sign on the "Certified Applicant" line.

Applicant Signature	Date
Certified Applicant's Signature	Date

FOR OFFICE ONLY

☐ Approved ☐ Disapproved	Fisheries Staff Specialist
☐ Approved ☐ Disapproved	Environmental Staff Specialist

Mail check or money order in the amount of $5.00 to:

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
COMMERCIAL LICENSE CLERK
402 WEST WASHINGTON STREET ROOM W273
INDIANAPOLIS, IN 46204

AQUATIC CONTROL

Permit Map-Page 6 of Permit